



CTTS

Cable Test Terminations & Water Processing Unit



HAEFELY

Current and voltage – our passion

Sold & Serviced in USA by:



8526 Virginia Meadows Dr.
Manassas, VA 20109

(703) 365-2330

www.hvtechnologies.com

hvsales@hvtechnologies.com



Haefely renowned in the HV world, is a leading supplier of Cable Test Termination Systems (CTTS). Our CTTS has earned the industry's confidence and has gained an image as a first class product. Following our philosophy of continuous product improvement, we have upgraded the entire product line.

The CTTS line is backed by our 100+ years of experience in HV testing. They make HV testing of cables fast and easy. Major highlights of the product

line are very short peeling lengths for routine testing, interchangeable tubes with higher LI specification for impulse tests, SI specification and C/tan δ testing point. All these lead to reduced long term ownership costs.

CTT values are calculated for dielectric resonant power supplies with Q-factor of 10 to 40.

AC ✓

200 ... 1000 kV

LI ✓

450 ... 1600 kV

SI ✓

700 ... 1100 kV

PD ✓

200 ... 600 kV ≤ 2 pC
700 ... 800 kV ≤ 5 pC

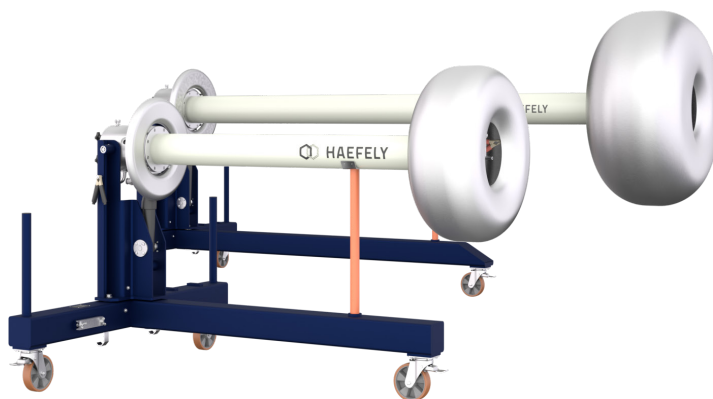
Features

- * Shortest peeling length in the market, perfect for routine tests
- * Specified for AC, LI and SI
- * Optional Interchangeable tubes with longer lengths for higher LI and SI specifications
- * Capacitance and Tan delta testing points
- * Accurate conductivity setting

Works with Series Resonant Systems

Multiple Cable Diameter

	AC	LI	SI	Max. cable Ø	Dimension LxWxH	Weight	WPU	
	[kV]	[kV]	[kV]	[mm]	[m]	[kg]	[kg]	qty
CTT 200	200	450	-	115, 130	1.5 x 1.9 x 1.1	330	-	1
CTT 250	250	550	-	115, 130, 165	1.7 x 1.9 x 1.1	340	440	1
CTT 350	350	750	-	115, 130, 165	2.3 x 1.9 x 1.3	420	590	1
CTT 400	400	950	-	130, 165	2.6 x 1.9 x 1.3	430	600	1
CTT 500	500	1200	950	130, 165	3.4 x 1.9 x 1.5	500	670	1
CTT 600	600	1500	1000	130, 165	3.9 x 1.9 x 1.5	540	710	1
CTT 700	700	1600	1100	165	4.2 x 1.9 x 1.5	-	750	2
CTT 800	800	1900	1200	165	5.2 x 1.9 x 1.5	-	790	2
CTT 1000	1000	on request						2

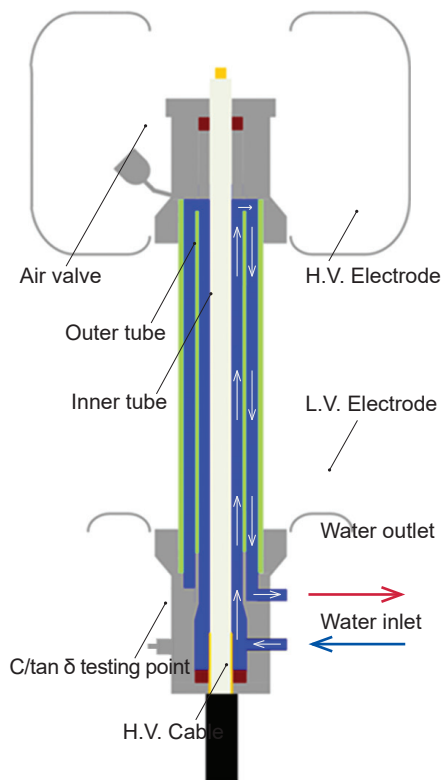


Benefits

- * Low Ownership cost as peeling length and prep time is short
- * One compact, integrated system covers AC, LI, SI, PD C/Tan Delta, Step test
- * Small foot print
- * 20% higher withstand voltage test possible than rated voltage
- * Special deionization system, minimal opex

Compact

Low Cost of Ownership



Principle

Each termination – comprising inner- and outer-tubes and electrodes at the high and low voltage ends – is mounted on its own base frame with wheels. The aim of the CTT is to attain a linear voltage distribution along the tubes of the termination to avoid field enhancement and partial discharge on the surface. This is achieved by water with low conductivity. The water processing unit continuously regulates the conductivity of water so that it stays at the set value. It also has a heat exchanger to cool water.

The cable is prepared by first stripping the cable to the insulating layer. Then, it is inserted into the terminations. Water-tight seals are slipped over the cable at both termination insertion points. Moulds and silicon compounds are supplied with our CTTs so seals can be easily reproduced.

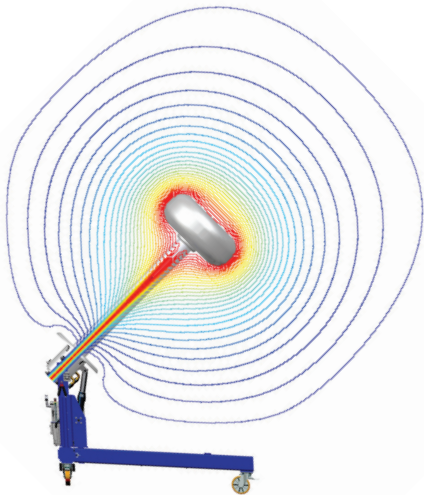
Without any reconfiguration, PD measurement can be followed by an impulse test and another PD measurement. A $C/\tan\delta$ connection point is available to do dielectric power loss measurements

Optimized Design

This series of terminations has the shortest possible tube lengths which keeps wastage of cable and preparation time at a minimum. However, if the tubes get too short the chances of PD or flashovers increase. That is why Haefely with its many years of experience has improved the design of the terminations through a special optimization process based on FEM calculations of the electric field. The picture on the left side shows an example of a computerized plot of the equipotential lines.

Interchangeable Insulating Tubes

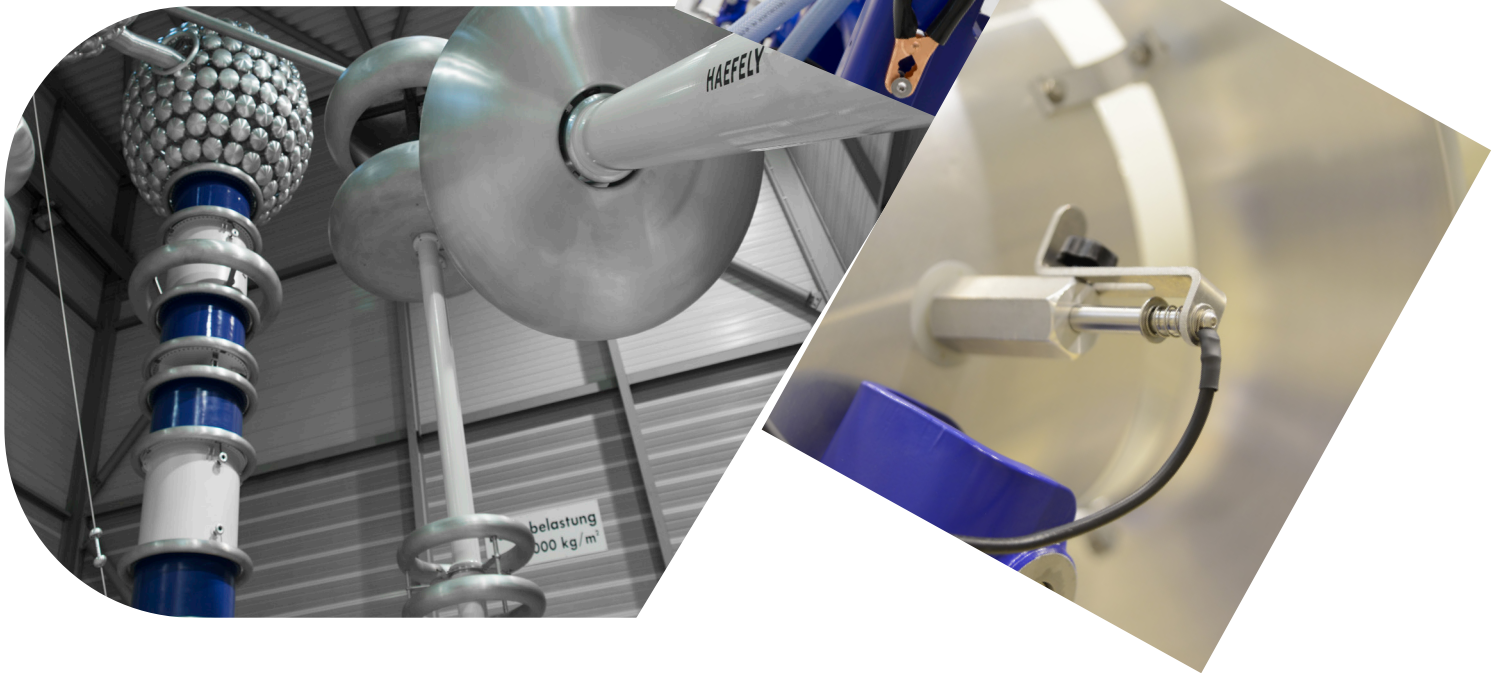
Our innovative design enables our customers to change to tubes with higher LI & SI specifications for impulse tests, thus making the system highly flexible.



Perfect Investment

As a result of the new CTT design optimal peeling lengths and preparation times are achieved. Using these CTTs leads to measurable advantages during cable testing which save time and money for the user.

The CTTs from Haefely are the most economical choice compared to other test terminations



Scope of supply

- 2 terminations on separate trolleys
- 2 cable seal moulds
- Silicone compound for 4 seals

Options

- Motorized Jacking
- C/tangent delta point
- Longer tubes for higher LI specification
- SI service Package
- Adapters for WC 120 water conditioners

Accessories

- Repair kit
- Spare outer tube
- spare inner tube
- 5 kg silicone sealing compound

Water Processing Unit

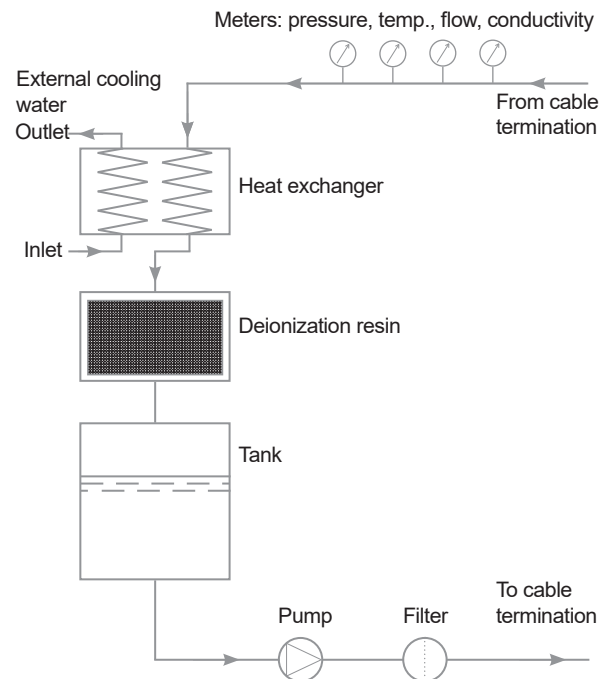
Principle

The water processing unit, WPU, regulates the conductivity of the water and serves as cooling system. Thermal losses, which are generated in the CTT during the cable test are dissipated in the WPU, to avoid an overheating of the water. The regulation of conductivity is very important to provide and ensure thermal stability of the system also during long term test. The WPU uses a deionizing resin to regulate conductivity. After the test is done, it also empties the tubes.

In routine AC testing mode, the CTT and the WPU form a closed water circuit. To ensure ample thermal stability, the WPU has a tank holding up to 500 liters of deionized water. The pneumatic valves allows PD-free operation. Operators can input compressed air from the factory supply or from the internal compressor. A remote control is also available so users can operate the WPU from the control room.

The WPU allows automatic filling of the CTT with conductive water for lightning impulse test.

The WPU comes complete with a set of hoses with quick release couplings, pneumatic couplings for external air supply, and interfaces for SI extension and remote control.

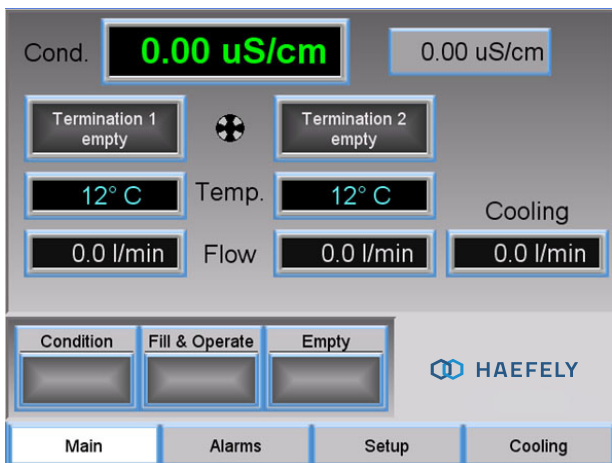


Engineered Safety

The WPU's state-of-the-art technology provides several important safety features to monitor temperature, pressure, water flow, and conductivity. Moreover, the WPU includes context-based warning messages, emergency stops, safe circuit interlocks, and pressure valves for operating comfort.

Software

The WPU has a modern user friendly touch screen interface for intuitive and convenient operation. The application software has ready made functions such as AC and LI modes making switching between test modes easy, without any reconfiguration. It regulates continuously the conductivity with a resolution of $\pm 0.01 \mu\text{S/cm}$.





Technical Data

Deionized water capacity	500
Max. cooling power	120 kW
Conductivity control range	0.1 - 20 $\mu\text{S}/\text{cm}$
Conductivity control resolution	0.01 $\mu\text{S}/\text{cm}$
Ambient temperature	3 ... 35 °C
Power supply	230 V / 50 or 60 Hz / 16 A
Max. cooling water temperature	20 °C
Min. flow rate in external cooling circuit @ 20°C	85 l/min
Couplers for external cooling circuit and terminations	1"

Scope of supply

- Water Processing Unit
- 4 hoses 1" dia, 12 m long
- 2 x 25 l, Deionization resin
- 1 Spare filter cartridge for main filter
- 1 spare parts case



Options

- Remote control
- Switching Impulse Service Package
- Adapters for WC 120

Accessories

- 2 x 25 l, Deionization resin
- Filter bag
- Filter Cartridge for main filter

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hvsales@hvtechnologies.com

Global Presence

Europe

HAEFELY AG
Birsstrasse 300
4052 Basel
Switzerland

☎ + 41 61 373 4111
✉ sales@haefely.com

China

HAEFELY AG Representative Office
8-1-602, Fortune Street, No. 67
Chaoyang Road, Beijing 100025
China

☎ + 86 10 8578 8099
✉ sales@haefely.com.cn

HAEFELY

Current and voltage – our passion

